

Maintenance, Monitoring, and Success Criteria for the San Elijo Lagoon Nature Center Project On-site Planting Plan

Prepared for

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1.0 Introduction

This report outlines the maintenance, monitoring, and success criteria for the on-site planting plan for the San Elijo Lagoon Nature Center Project (project). The proposed project is located at the existing San Elijo Lagoon visitor center, which is located within the northwestern portion of San Elijo Lagoon County Park and Ecological Reserve (San Elijo Lagoon). San Elijo Lagoon is located west of Interstate 5 and south of Manchester Avenue, in the City of Encinitas in northern San Diego County (Figure 1). The goal of this project is to replace the existing visitor center, trailer, and storage shed (approximately 4,900 square feet), with a new, more efficient, two-story Nature Center (approximately 7,500 square feet). The new Nature Center will be constructed on a footprint similar to that of the existing visitor center. Potential impacts from construction include temporary impacts up to 0.149 acre and permanent impacts of up to 0.008 acre of coastal California gnatcatcher (*Poliophtila californica californica*; CAGN) occupied coastal sage scrub habitat. This maintenance, monitoring, and success criteria plan is to serve as an appendix to the on-site planting plan prepared by Zagrodnik + Thomas Architects, LLP. The on-site planting plan includes revegetation of temporary impacts (0.149 acre) and approximately 0.011 acre (476 square feet) of new habitat.

2.0 Existing Conditions

The topography of the existing visitor center ranges from approximately 17 feet above mean sea level (MSL) at the southeastern side to approximately 22 feet above MSL at the northwestern side (Figure 2). The visitor center lies north of San Elijo Lagoon, within approximately 150 feet of the water's edge. Soils within the project site are predominantly Corralitos loamy sand (CsC) with 5 to 9 percent slopes, with terrace escarpments (TeF) located within the northwestern edge of the site (U.S. Department of Agriculture 1973).

Diegan coastal sage scrub is the existing native plant community and the habitat to be restored on the proposed San Elijo Lagoon Nature Center site.

2.1 Native Plant Community — Diegan Coastal Sage Scrub

Diegan coastal sage scrub is the southern form of coastal sage scrub. It occurs in areas with low moisture-availability, steep slopes, or xeric or clay rich soils (Holland 1986). Sage scrub communities are dominated by lower-growing shrubs and subshrubs that are

Figure 1; COLOR—8.5x11

Figure 2; COLOR—8.5x11

facultatively drought deciduous. Many of the shrubs and subshrubs in coastal sage scrub are three to six feet tall and have relatively open canopies. In addition, there is often a significant herbaceous understory, including native grasses and colorful native annual wildflowers.

Diegan coastal sage scrub surrounds the majority of the current visitor center. California sagebrush (*Artemisia californica*) is the dominant species within this habitat, along with bush sunflower (*Encelia californica*), black sage (*Salvia mellifera*), flat-top buckwheat (*Eriogonum fasciculatum*), coast goldenbush (*Isocoma menziesii*), and scattered lemonadeberry (*Rhus integrifolia*). Common herbaceous species also observed on this site include purple needlegrass (*Nassella pulchra*) and tarweed (*Deinandra fasciculata*).

2.2 Lands to be Restored

Two areas, adjacent to the proposed Nature Center will be restored to Diegan coastal sage scrub (Figure 3). These two areas consist of disturbed land and an area which is currently included in the footprint of the existing visitor center. In addition, all areas of existing coastal sage scrub which are temporarily impacted during construction will be restored.

3.0 Responsible Parties

3.1 County of San Diego

The entity undertaking the restoration must make a good faith effort to meet success criteria. The responsibilities are itemized below:

- Fund the maintenance and monitoring of the habitat restoration on the property as outlined in this plan.
- Hire qualified entities for the tasks described in this plan to install and maintain the project, or have the restoration biologist subcontract them.
- Administer contracts for implementing the plan.
- Decide to stop work, suspend payment, or terminate contracts for inadequate performance. This includes all phases of project installation, long-term maintenance, and biological monitoring. The restoration entity may replace any of these providers if necessary.
- Pay for plants, seeds, and other materials needed for restoring the habitat.

Figure 3; COLOR—8.5x11

3.2 Restoration Biologist

The restoration biologist must have a minimum of two years of experience in upland habitat restoration. The restoration biologist must understand upland plant communities and have expertise in upland plant and wildlife identification and ecology. The restoration biologist will be retained during habitat restoration to perform the following tasks and be responsible for implementing the restoration plan in accordance with its specifications:

- Oversee maintenance of the habitat restoration areas as defined herein.
- Oversee and perform the required monitoring and reporting in accordance with the procedures established in this plan.

3.3 Contractor

The grading contractor shall be responsible to:

- Perform the required maintenance as directed by the restoration biologist.

4.0 Reference Site for Monitoring

In conjunction with the first year of monitoring (see Section 7.0, Monitoring Methods), the restoration biologist will sample vegetation transects through the mature coastal sage scrub community which exists on-site in order to determine plant species composition, diversity, density, and cover. Sampling protocol will follow that presented in the Section 7.0 of this document. The data collected from the existing on-site coastal sage scrub will also be used as the baseline for evaluating restoration site success. A minimum of six transects will be sampled to provide an accurate estimate of the baseline community composition.

5.0 As-Built Plan

This restoration project will require an as-built plan to be prepared and submitted to the County of San Diego. The as-built plan covers the time period from when implementation of restoration begins to the end of the main planting activities.

The as-built plan will document what was done to prepare the site for restoration, and to plant and seed the site. Throughout implementation of restoration, the restoration biologist will keep records including dates of site preparation, container plantings, and seeding. These, along with any significant problems encountered, or necessary changes made in the field, will be recorded and included in the as-built restoration plan. The as-built plan will include photographs of the restoration activities and the site after it is planted and seeded. The as-built plan will be submitted to the County of San Diego within 30 days of completion of planting and seeding.

6.0 Maintenance

The maintenance period will follow the construction year and will last for five years or until success criteria are achieved (Table 1). In the instance of catastrophic events, however, maintenance shall not extend beyond the original term of five years. The maintenance program will include weed control, debris removal, replanting, and reseeding, as well as other tasks as required for the site to grow and achieve the success criteria established in this plan. Maintenance measures will be conducted by maintenance personnel who are experienced in caring for native plant communities.

TABLE 1
APPROXIMATE MAINTENANCE SCHEDULE

Type/Task	Year 1	Year 2	Year 3	Year 4	Year 5
Weed control	As-needed up to five times	As-needed up to four times	As-needed up to four times	As-needed up to four times	As-needed up to four times
Trash removal	Monthly	Quarterly	Quarterly	Quarterly	Quarterly
Replanting/seeding	Winter	Winter	Winter	—	—
Irrigation	As-needed	As-needed	Remove	—	—

6.1 Weed Control

Weed control will continue throughout the monitoring period. Exotic species will be removed by hand, mechanical weed cutters, or herbicide applications (Roundup®) by maintenance workers familiar with and trained to distinguish weeds from native species. During the first year, weeding will be performed as needed up to five times to keep weeds from producing seeds and to control weed competition during the establishment period of native plants. Weeding will continue four times per year thereafter. Weeds will be killed or removed before they set seeds. Appropriate weed control measures will be implemented under the direction of the restoration biologist. A list of exotic species anticipated to grow on the site is presented in Table 2. In the event that additional invasive plant species are encountered, the restoration biologist will refine measures to control them.

TABLE 2
ANTICIPATED EXOTIC PLANT SPECIES THAT MAY NEED TO BE CONTROLLED

Scientific Name	Common Name
<i>Atriplex semibaccata</i>	Australian saltbush
<i>Avena</i> spp.	Wild oats
<i>Brassica</i> spp.	Mustard
<i>Carpobrotus edulis</i>	Iceplant
<i>Erodium</i> spp.	Filaree, storksbill
<i>Eucalyptus</i> spp.	Eucalyptus
<i>Foeniculum vulgare</i>	Fennel
<i>Hypochaeris glabra</i>	Smooth cat's-ear
<i>Nicotiana glauca</i>	Tree tobacco
<i>Ricinus communis</i>	Castor bean

Salsola tragus
Schinus molle

Russian thistle
Peruvian pepper

6.2 Vegetation Clearing and Trash Removal

Pruning of any native vegetation or removal of deadwood and leaf litter shall not be allowed in the revegetation areas. Trash will be removed from the site by hand on a monthly basis, or as necessary, for the duration of the first year and quarterly thereafter. Within the context of restoration, trash consists of all man-made materials, equipment, or debris left within the revegetation area that is not serving a function related to revegetation.

6.3 Replacement Plantings and Reseeding

The habitat quality of the restoration site is expected to improve each year of the maintenance and monitoring period. The restoration site will be replanted and/or reseeded with appropriate species or species that did not produce adequate seed during the implementation year, if necessary. This process will be repeated every year as needed to increase species diversity and cover and to improve long-term plant community stability. Additional seeds will be hand broadcast early in the rainy season (October to December). Plants which may have died will be replaced with appropriate container sized plants and slow-growing species that were not prepared in time for the initial planting will be planted from containers.

6.4 Irrigation Maintenance

Irrigation will be applied as needed (as determined by the restoration biologist) for the first two maintenance and monitoring years. Maintenance of irrigation lines will be performed periodically and the system will be repaired whenever necessary to keep it functioning properly. At the direction of the restoration biologist, the irrigation system will be removed or turned off when the plants have become established and irrigation is no longer necessary. If the irrigation system is removed, the restoration biologist should monitor the removal so that native plants are not damaged.

7.0 Monitoring Methods

The monitoring period will begin with implementation of the restoration work and will last for five years or until the restored vegetation has met success criteria. A monitoring schedule is presented in Table 3. The monitoring program will be conducted by the restoration biologist as outlined below.

TABLE 3
MONITORING SCHEDULE (APPROXIMATE)

Type/Task	Year 1	Year 2	Year 3	Year 4	Year 5
<u>Qualitative</u> Monitoring	Weekly/ Monthly	Monthly	Quarterly	Quarterly	Quarterly
<u>Quantitative</u> Spring vegetation sampling	—	Annually	Annually	Annually	Annually

7.1 Qualitative Monitoring

Evaluation of plant health and identifying and correcting problems as they arise are necessary for ensuring successful vegetation establishment. Qualitative monitoring will be conducted weekly for the first two months following the construction year and monthly for the remainder of the first year. Qualitative monitoring will occur monthly for the second year and quarterly for the remainder of the maintenance and monitoring period. Qualitative monitoring involves the restoration biologist's reviewing the revegetation areas to examine transplant vigor, native annual and grass germination, and exotic plant encroachment and control.

7.2 Quantitative Monitoring

Quantitative monitoring will be performed to measure development of vegetation in the restoration areas and to document that the restoration areas achieve the success criteria as defined by the performance standards.

Beginning in Year 2, a permanent vegetation sampling station will be established within the restoration site to measure year-to-year changes in shrub or tree cover, density, and diversity following the protocol of the California Native Plant Society (CNPS) Plant Communities Project (Sawyer and Keeler-Wolf 1995). This data will be compared to baseline data collected from the on-site coastal sage scrub reference site. Results will objectively demonstrate if the restoration areas approach the community characteristics of the reference habitat.

The CNPS sampling method is based on a 50-meter point transect centered on a 5×50-meter plot. Due to the small size of the revegetation areas, this will be reduced to 10-meter transects. Using this method, vegetation is sampled by the point method at 0.5-meter intervals along the 10-meter transect to determine cover. The surveyor will note the species encountered and classify its height (i.e., herb, shrub, or tree) at each interval. In addition, each shrub-sized individual of each perennial species growing in the 5×10-meter plots will be counted to determine shrub density and diversity. All annuals present in the 5×10-meter plots will also be noted.

Sampling will be conducted in the spring so that the maximum species diversity will be recorded. At least three plots will be established to determine vegetation cover, plant community composition, vegetation density, and plant diversity of each area. A

photograph will be taken from each sample endpoint (toward the plot) each time the site is monitored to record the progress of mitigation over the monitoring period.

8.0 Monitoring Reports

Annual reports summarizing monitoring results of the on-site restoration project will be submitted to the County of San Diego per permit conditions by the restoration biologist within one month of the end of the monitoring year. The quantitative monitoring section will include survey methods, data summary analysis, comparison to performance standards, discussion, reporting remedial actions, recommendations, and photodocumentation. Each annual report will compare findings of the current year with those in previous years. The annual monitoring reports will then be submitted by the County to the US Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG).

9.0 Performance Standards

On-site revegetation of disturbed land and temporary impacts on the Nature Center site will be considered successful when the performance standards have been met. The habitat must sustain itself for a minimum of two years in the absence of significant maintenance measures after the third year of monitoring. Significant maintenance measures include replanting or seeding, eradication of major weed infestations, and erosion repairs. Other maintenance measures (such as weed and erosion control in small areas) may continue until the end of the monitoring period. Performance standards described below, for achieving a percentage of cover, diversity (species composition), and species dominance similar to mature coastal sage scrub, will be based on reference area values (see Section 4.0, Reference Site for Monitoring).

9.1 Plant Community Development

The restoration areas will show a developing trend of vegetation cover, density, and diversity that is similar to the reference area habitat. These measurements will be taken during the quantitative monitoring. After three years, the proportional cover and density of native plant species shall be 60 percent of the native cover value determined for the reference areas. The native species diversity (species composition) must be high throughout the maintenance and monitoring period, and after three years shall be 65 percent of the reference area's value (Table 4).

During the quantitative monitoring, percent transplant survival will be taken as an absolute measure. The number of surviving plants will be counted and compared to the original number planted. Transplant survival shall be 100 percent after three years (see Table 4).

If the goals listed above are not met, the restoration biologist will determine if remedial actions are necessary on the portions of the restoration site that do not meet the three-year success goals.

TABLE 4
FIVE-YEAR PERFORMANCE STANDARDS AS
A RELATIVE PERCENTAGE OF REFERENCE AREA VALUES

Year	Transplant Survival	Coverage of Shrubs and Herbs	Density	Diversity
1	90	30	50	50
2	100	45	60	60
3	100	60	65	65
4	100	75	70	70
5	100	80	80	75

At the end of the monitoring period, the proportional cover of native plant species shall be 80 percent of the native cover value determined for the reference areas. Native species diversity (richness) shall be at least 75 percent of the reference area's value, and the density shall be 80 percent consistent. Percent transplant survival shall be 100 percent (see Table 4).

9.2 Tolerance of Weeds

The cover tolerance of weeds and non-native annual grasses, as identified by the restoration biologist, will be no more than 10 percent. The tolerance of perennial species such as giant reed and pampas grass will be 0 percent throughout the five-year maintenance and monitoring period.

9.3 Maintenance Measures

The restoration site will not have required significant maintenance measures (replanting, eradication of major weed infestations, and erosion repairs) during the last two years of the monitoring period, as certified by the restoration biologist.

10.0 Remedial Actions

If restoration on the San Elijo Lagoon Nature Center Project site does not meet the standards established above, the restoration biologist will develop remedial measures, probably to include reseeding or replanting certain areas. After remedial measures have been implemented, maintenance and monitoring shall be according to the steps in this plan until the restoration site meets the performance standards.

11.0 Notification of Completion

Upon satisfactory achievement of the performance standards for the San Elijo Lagoon Nature Center Project restoration area, the restoration biologist shall notify the County of San Diego. Within two months of the notification, a site review will be scheduled with representatives from USFWS and CDFG to review the restored areas.

12.0 References Cited

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- 1986 Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program, California Department of Fish and Game. October.

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- 1995 A Manual of California Vegetation. California Native Plant Society, Sacramento.

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- 1973 Soil Survey, San Diego Area, California. Soil Conservation Service and Forest Service. Roy H. Bowman, ed. San Diego. December.

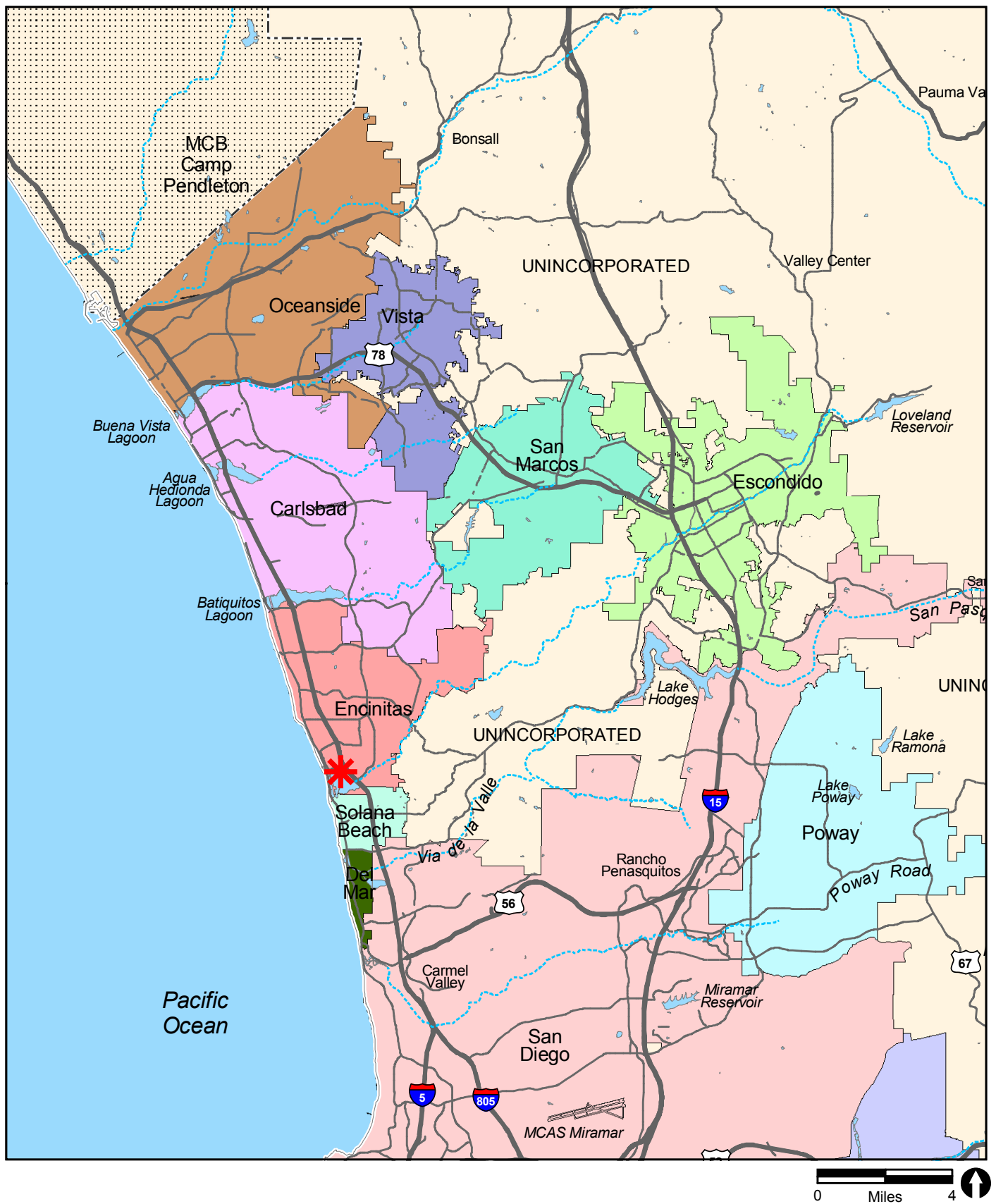
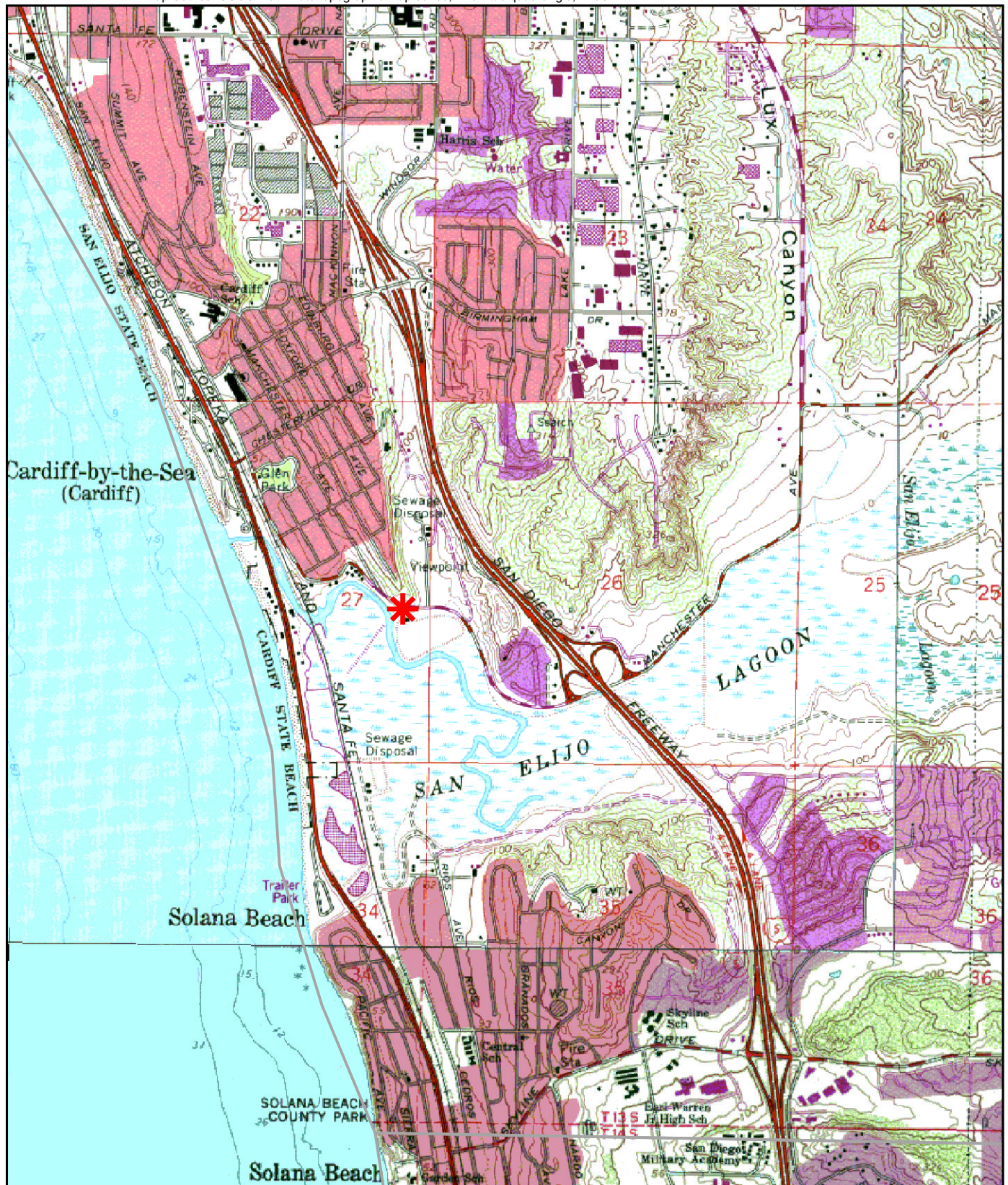


FIGURE 1

Regional Location of the San Elijo
Lagoon Nature Center Project






 Project location



FIGURE 2

San Elijo Lagoon Nature Center
Project Location on USGS Map



-  Proposed Building Footprint
-  Temporary Impact Restoration Area
-  Permanent Impact Restoration Area

